

**Yellowstone Winter Use Adaptive Management Program
Air and Soundscape Working Group**

**February 26, 2014
Meeting #1 Notes**

Discuss and Prioritize Current Monitoring and Research Needs for Your Impact Topic

Participants:

Allison Kein – YELL/NPS, cartographic technician; taking notes for the group;
Amy MacKenzie-Sanders – Representing herself, retired health specialist in Billings;
Ann Rodman- YELL/NPS, Branch Chief for Physical Resources and Climate, Air Quality Group Leader;
Fred Button – Representing himself;
John Klaptosky – YELL/NPS, air and sound monitoring technician
Jon Catton – Bozeman – worked for a number of conversation groups over the years;
Kim Raap – Trails Work Consulting representing the State of Wyoming;
Kurt Angersbach – member of the public and winter user of Yellowstone;
Shan Burson – GRTE & YELL/NPS – Bioacoustic Ecologist, Soundscape Group Leader

Shan Burson and Ann Rodman sent the following out to the group before the meeting

- **Air_Quality_Working_Group_Feb26_Meeting_Info.docx:** summary of current AQ monitoring, summary of current understanding of AQ related to OSV use, summary of acceptable impact levels from ROD, summary of comparability studies
- **Winter Use Soundscape Monitoring 2013-2014.docx**
- **Soundscape Studies for Yellowstone Winter Use 2003-2013.docx:** summary of what has been done
- **Draft Yellowstone Winter Acoustic Monitoring_1July13.pdf:**
- **Link to Winter Use Plans,** previous years' monitoring reports, and the Scientific Assessment at http://www.nps.gov/yell/parkmgmt/winter_monitoring.htm. (Soundscape sections start on pg. 127 and 261 in the Supplemental Environmental Impact Statement (SEIS))
- **Link to ROD** see <http://www.nps.gov/yell/parkmgmt/currentmgmt.htm>
- **Yellowstone WUAMP Nov13 Meeting Notes.docx:** Summary and notes from first group meeting and additional comments from Jon Catton

Discussions with Working Group on 26 February 2014:

- I. **What basic monitoring is needed to evaluate the impacts of OSV use on your resource/topic and to ensure these impacts stay within the range predicted under the Selected Alternative (final SEIS)?**

AQ:

- Group agreed that current air quality monitoring at OF and West should continue.
- Ann mentioned that the NPS plans to continue monitoring the same things at West and OF unless the group recommends a change. The modeled maximum values in the ROD are the values that we can't exceed. Unless we reach those maximum numbers of OSV we won't know

what the actual maximum impact will be.

- Fred asked if we had done any work to confirm the assumption that the West - OF corridor has the highest level of impact from OSV emissions. He asked if there was a way to confirm these assumptions. He mentioned the AQ monitoring at Lake.
- Ann replied that we know that most traffic occurs along that corridor and we feel comfortable with the assumption that the biggest impact to AQ will occur where the most OSV congregate. Ann stated that if traffic patterns changed we would need to reassess where we monitor impacts to air quality.
- Kim agreed that traffic at OF and West is higher than in other areas of the park.
- *Note - It would be worth checking traffic at Madison warming hut and Canyon by the Visitor Center to see how they compare to West Entrance.

Soundscapes:

- Shan –We’ve been doing what I think are most important things to do to address the noise impacts of oversnow vehicles, but it is my hope that the working group can come up with other ideas.
- Kim – You have three planned activities (*a*-continue using automated sound monitoring systems, *b*-conduct standardized pass-by measurements of oversnow vehicles, and *c*-new acoustic mapping at visitor destinations) in your winter use 2013/2014 workplan, so I guess I would take that as the next step. Those three points all look good.
- Shan – Yes, we are doing those things this winter that and I think it would be useful for them to continue.
- Kim – Continuing on that what I would see as extensions from the past is work you’ve already started with intensive monitoring of oversnow vehicles, new effort for some acoustical mapping, and BAT requirements.
- Shan – We’ve been primarily focusing on noise from oversnow vehicles and using autonomous sound monitoring stations, so we have huge amounts of data from specific locations, but we haven’t really focused on what visitors are experiencing at locations that they visit regularly. That is what the new acoustic mapping work is trying to address. The results of it would be useful for managers and could help visitors have more accurate expectations for their trip into Yellowstone in winter. The data collection is going very well.
- Jon Catton – I would echo Kim. Yellowstone NP does a stunning, amazing amount of monitoring and has developed a useful and fascinating body of data. It seems to flow from that that continuing to monitor the same sites is going to be incredible helpful so we can see relative to recent history what changes occur. In terms of understanding WHY the changes are occurring, it seems to me that you’re going to have new vehicles with the BAT standards, new numbers, and also new groupings of vehicles, and new speeds, and different vehicular behavior. My question is how long do you think continuing to monitor at some of the most important sites is going to be needed to understand critical factors that aren’t just kind of noise in the data? Where you can say here’s why what’s happening is happening? Secondly, how will you key out the most important factors – hey it’s this technology that has been beneficial to the soundscape or the speeds that make a big difference?
- Shan –While things are transitioning with the new winter use plan, I think it is important to continue monitoring every winter. If patterns of use become predictable then it might not be necessary to monitor every winter. But for the next several winters it’s important to monitor sound. To know what’s affecting the soundscape, I might want to associate cameras more than I have been so we can identify what vehicles are passing by to determine what is creating the

noise. For speed, it might be more difficult, but we'll get an idea from law enforcement rangers and others if OSVs are complying with the speed limit. We also have a lot of modeling results that we can look at and compare with the measured data.

- Jon – Thanks that's very helpful. When you say for the next several winters it would be valuable to continue monitoring, could you explain some of the year-to-year vagary or uncertainty about what it is you're able to determine that would make it important to go several years and not just a year or two and then start scaling it back?
- Shan –The winter use plan is written with the different phases of implementation. For example, BAT requirements for snowcoaches and snowmobiles that will go online in upcoming winters. There are just some changes of what's allowable until phase 3. And then after that it seems like it would take at least a few years to see if things are settling out. And there is always some variability from year to year. I would recommend continue monitoring annually until at least three years until after the last phase has been implemented.
- Ann – So what I got from that is that we should keep doing what we're doing and Shan mentioned that there wasn't specifically any new, but some of the things he's doing with mappings would add some more information, but I didn't hear anybody bring up anything that we're not doing that they think we should be doing.
- Jon – Things I'm curious about in terms of data gaps. It seems like there will be great value to know what types of vehicles (models) are doing a particularly good job, for whatever reason, in reducing impacts. My understanding with that the digital recordings it is possible to determine what form of transportation is being heard. I was wondering how well the cameras are able to correlate with the audio recordings and get you a good remote sense of what is causing what, positively or negatively? And whether that is a substitute for observational studies.
- Shan – I think what we'll rely on most is the standardized passby measurements. All snowcoaches will have the standardized passby measurements before they are certified BAT compliant. The snowmobile manufacturers certify the noise emissions from snowmobiles for the same reason. And that will inform us quite well what are the quietest or loudest vehicles operating on a road. Our sound monitoring stations could be a check on that. The cameras I've occasionally, and am testing this winter, are motion and heat sensitive. There is a time and date stamp on every picture and those can be associated with the sound measurements. It's not an automated process, but it would be possible to identify the type of machine.
- Ann – And Shan when you conduct passby measurements you have an idea of the speed so you have some sense for each vehicle, not just an average sound. You do it at the maximum speed you're allowed so you have the maximum sound?
- Shan – Yes, 35 MPH for snowmobiles and 25 MPH if the snowcoach can go 25 MPH. A lot don't go that fast so then it is whatever their maximum cruising speed is.
- Jon – Is there a simple and potentially valuable way of monitoring speed as well as sound so you can correlate the loudest event of the day involves vehicles that were going at such and such a speed?
- Shan –That would be a really nice additional piece of information and there probably are traffic counters or other ways we could potentially measure speed. Nothing immediately comes to mind that would be really easy, but we certainly could look into, especially if this group thinks it's important.
- Jon – I'm tiering back to the three overarching goals of this adaptive management planning process; ensure that impacts stay within those that were predicted, secondly comparability, and thirdly providing for ongoing improvement. It seems like knowing the contribution of speed is

going to be very valuable and it could be helpful to some of the operators and what investment they would make.

- Ann -- Can we commit to at least what would be involved with remotely monitoring speed?
- Shan – Sure.
- Kurt – I’m curious to know if the snowcoaches are fully weighted or measured at the steepest incline, or at a flat area with just a driver in it?
- Shan – Typically just a driver and just another passenger and completely level surface. It is standardized so you can compare across models, test days, and conditions.
- Kurt – Do you think there’s value in knowing that difference between loads and road conditions?
- Shan – Well as a scientist I think knowing everything is valuable. It is clear that snow conditions make a big difference; soft, deep snow, greater load, etc. would cause OSVs to work a lot harder and generally be louder. But it would be a tough thing to try and standardize that. I think it would be a useful thing to know, and maybe from spot measurements along the road, under the worst conditions what are the sound levels? We certainly could try to do that.
- Kurt – So it is possible to find a difficult stretch and put a device there to measure the actual sound.
- Shan – That was what I was attempting to do this winter during the south entrance – deepest snow and incline going up Lewis Canyon and thought that might be a good place to see if it compared to other road segments and that’s why I have a camera there. There are some issues with a lot of snow comes a big snowberm that blocks sound propagation, but we could come up with some measurement areas where we could get maximum sound levels.
- Kurt – I only ask because if there is a maximum limit that needs to be achieved than that might affect the overall measurement.
- Shan – The predictions from the computer modeling in the winter use plan and record of decision include noise emissions produced from OSVs traveling along all road segments in Yellowstone. The criteria include an average sound energy and what percentage of the travel corridor and of the backcountry is affected by sound energy of a certain level. So it includes certain places to be louder and others to be quieter. The BAT certification is supposed to set the maximum limit on sound levels.

II. What research and monitoring is needed to gather additional data regarding the comparability of impacts from a group of snowmobiles versus a snowcoach to your impact topic?

AQ:

- Ann stated that comparability is only possible through direct measurement of emissions from tailpipes. She offered to bring in expertise from the NPS Air Resources Division if needed. She reminded everyone that information about AQ comparability is summarized on the last page of the pre-meeting notes that she sent out.
- Jon agreed and said it was hard to think about comparability for AQ outside of factory testing.

Soundscapes:

- Jon –I had a question about the duration of sound event and whether that is potentially an area of real significance. Because of how spread out a group of snowmobiles can be, I’m trying to think constructively about how groups of snowmobiles and individual snowcoaches might not be comparable where the spreadoutness of the group is in an area where a lot of visitors are.

Like Fountain Paint Pots, people are listening to their guides with traffic going by and it's very obvious in those situations that sometimes the loudest thing going by is a snowcoach other times it's a snowmobile group. What I'm struck by in those instances is the interruption of the enjoyment of the natural feature might be with one versus the other. I'm wondering if there is a knowledge gap about duration in the realm of comparability.

- Shan – That is one of the things we are trying to measure this winter, but we may not be fully getting it because we're doing a lot of other things in those areas too. We still will have a lot more data than we have had in the past in these close to the road areas. What we won't necessarily have is the levels or number of times that they're interrupting an experience or masking a natural feature. We have pretty good understanding that a group of snowmobiles is comparable to one snowcoach as you get farther away from the road. But closer to the road the dispersion of vehicles changes things. That is something we could look at more closely.
- Ann – So when you say that, are you talking about the length of time that the noise level is above a certain amount and that certain amount would be some amount of noise that would disrupt people being able to hear natural sounds?
- Shan – Yes, two things. One, there are known speech interference level of sound (55-60 decibels). So there's the peak level of a passby and you could measure that level and duration above that. And secondly, there is the number of occasions or events of those peak levels and those are two separate things.
- Ann – So the idea would be to do that and compare between a snowcoach and a group of snowmobiles over time. The snowmobiles, at least in my experience, those play out differently depending where you are and how close together they are, etc.
- Jon – I can imagine how speed limit change or guide training as they approach areas like Fountain Paint Pots, etc. might help. On any given day, many people are going to FPP or Biscuit Basin so understanding how the vehicular traffic and how it's grouped and how it affects them seems huge in a way that I wonder if historic monitoring has gotten to that yet?
- Shan – The data we have collected in past years do not answer that question. At the end of this winter we will have a better understanding. As soon as the data is analyzed we'll have a much better idea if this an issue and if it is we can design something to address or resolve the issue of what we can do. So I think we're on the road now to start answering some of these questions.
- Ann – Jon if you have places in mind and you could list them – Shan could cross-reference that with the places he thought were important
- Jon – I would totally defer to the park service interpreters and the guides because really this comes down to where they're routinely stopping on snowmobiles or snowcoaches to showcase things that make Yellowstone unique
- Shan – We are collecting measurements at 16 visitor destinations this winter.
- Kurt – I'm wondering if the guides are already informally observing a "hospital quiet zone" without any sort of regulation being imposed on them?
- John K – Yellowstone experiences a lot of wind and often the wind actually is the maximum sound level even with the passing by snowcoaches and snowmobiles. I don't think the guides, have any quiet time. They stop off at the warming huts but other than that they move through the park and try to hit the main attractions along the way.
- Ann – I would think that based on what we learn this winter, that the first thing we would do is share that information with the guides and people who have tours and if it is perceived to be a problem get input from people before you impose regulations.

- Kurt – Yeah I wasn't actually suggesting a new regulation. Whenever I go out I see signs about no idling by schools and keeping quiet areas around hospitals, so maybe that would be easy to implement if it was necessary.
- Jon – I would ask too – I think of that bald eagle nest a few miles in from the West Entrance where park service trainings made guides sensitive to the sensitivity of that bald eagles nest and that has been a boon to them and they've had a better story to tell– why we're stopping here and why we're only going to linger this long. That's part of the thrill and understanding of the visitors.
- Shan – I typically complete a draft report of the winter's sound monitoring by July 1st, but could work on some aspects of it earlier if it's a priority. As soon as this winter season is over I can start compiling and I will share the results with this group as soon as I can.

III. What additional information (research) is needed about the social and ecological impacts of winter use to further reduce impacts to this topic?

AQ:

- Ann mentioned the uncertainty of future NO2 levels based on an unknown mix of snowmobiles and snowcoaches with new BAT and EBAT technologies and said that monitoring will be important as we move forward.
- Kurt mentioned that the public seems to be choosing travel by snowcoach over travel by snowmobile and was concerned that too many snowcoaches might create AQ impacts that exceed what is allowable. He also wondered if the public is being informed that there is a big difference between the emissions from the two modes of transportation and that they are not an equal tradeoff.
- Ann replied that the modeling was based on the maximum impact from the maximum number of snowcoaches that would be allowed under each option and that our responsibility was to make sure our monitoring can confirm that we stay below the impacts predicted by the modeling. She stated that the leads from each working group will talk each month to compare notes and share information between groups.
- Kurt also mentioned that snowmobiles are regulated by the EPA, but existing snowcoaches will need to be monitored by the NPS, which is a bigger burden on the NPS.
- Ann stated that the notes of the meeting will capture this concern about public perception of the difference (or the similarity) in emissions between snowcoaches and snowmobiles. She mentioned that everyone in the group will have the chance to add comments to the notes before we put them on the website.

Soundscapes:

- Shan – Things that have been brought up in this call-
 - How the speed of the vehicles impacts the soundscape,
 - The difference between the standardized passby noise measurements and the noise emitted by vehicles under greatest load, and
 - The difference in noise impacts between snowcoaches and groups of snowmobiles at visitor destinations close to the travel corridors.

ACTION ITEMS

1. Shan is in charge of scheduling the next meeting. Everyone agreed that the Doodle Poll method worked. We will aim for April.
2. Working group members should send any questions, comments or feedback to Shan or Ann on the meeting minutes, meeting discussion and the agenda for our next meeting.
3. Shan will investigate how to might be possible to collect speed measurements on travel corridors.
4. Our homework is to produce the statement of research and monitoring needs that Rebecca requested below (in #5.). Unless someone from the group wants to write the first draft, Shan and Ann will write the first draft based on the meeting notes and send it out to the group for comments and additions.
5. Provide Statement of Research and Monitoring Needs in March 2014
 - a. Brief Description and Table of Monitoring Studies Needed to make sure impacts stay within the range predicted under the SEIS
 - b. List of two or three Priority Research Questions Related to Understanding and Assessing Comparability of OSV Impacts and a Rationale for These Questions Explaining How They Address Key Uncertainties
 - c. List of two or three Priority Research Questions that further examine the social and ecological impacts of winter use on your impact topic and a Rationale Explaining how these questions address key uncertainties and help advance our understanding about how to further reduce impacts on park resources